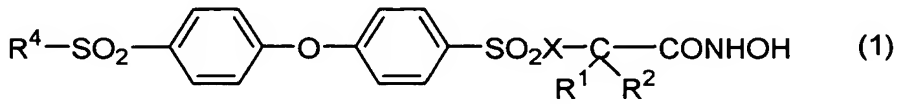
CLAIMS

1. A hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof, which is represented by the following formula (1),



(1)

, wherein R^1 and R^2 are each independently hydrogen atom, optionally substituted lower alkyl group, or lower haloalkyl group, or R^1 and R^2 are bound together to form C2~7 straight alkylene group, or a group represented by a formula, $-(CH_2)m-Y-(CH_2)q-$ (wherein Y is -O-, $-NR^5-$, -S-, -SO-, or $-SO_2-$, m and q are each independently an integer of 1 to 5, and the total of m and q are 2~6, and R^5 is hydrogen atom, optionally substituted lower alkyl group, optionally substituted lower alkylcarbonyl group, optionally substituted lower alkoxycarbonyl group, optionally substituted lower alkylsulfonyl group, optionally substituted sulfamoyl group or optionally substituted carbamoyl group), X is methylene group or NR^3 (wherein, R^3 is hydrogen atom, or optionally substituted lower alkyl group, or R^3 may be bound with R^1 together with their binding N atom and carbon atom to form optionally substituted heterocycloalkane.), and R^4 is C1~4 lower alkyl group.

2. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to in claim 1, wherein R^1 and R^2 are each independently hydrogen atom, or C1~3 lower alkyl group.

3. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein R^1 and R^2 are bound together to form C3~5 alkylene group.

4. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein R^1 and R^2 are bound together to form a group represented by the formula, $-(CH_2)m-Y-(CH_2)q-$.

5. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 4, wherein m and q are espectively 2 in the formula, $-(CH_2)m-Y-(CH_2)q-$.

6. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein X is $N-R^3$, and the R^3 is hydrogen atom, C1~4 lower alkyl group, carboxy group, phenyl group (the said phenyl group may be substituted by lower alkyl group, lower alkoxy group or halogen atom.), 2-pyridyl group, 3-pyridyl group, 4-pyridyl group, furyl group, thienyl group (the said pyridyl group, furyl group and thienyl group may be substituted by lower alkyl group.), or C1~4 lower alkyl group substituted by lower alkoxycarbonyl group, lower alkoxy group or lower cycloalkoxy group.

7. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein X is $N-R^3$, and the R^3 is bound with R^1 to form together with their binding N atom and carbon atom, optionally substituted pyrrolidine, piperidine, piperazine, morpholine or thiomorpholine.

8. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein X is methylene group and R^1 and R^2 are bound together to form C3~4 straight alkylene group or $-(CH_2)_2-O-(CH_2)_2-$.

9. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to any one of claims 1 to 8, wherein R^4 is methyl group.

10. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to claim 1, wherein R^1 and R^2 are each independently, hydrogen atom or C1~4 lower alkyl group, or R^1 and R^2 are bound together to form C3~4 straight alkylene group or a formula, $-(CH_2)_2-Y-(CH_2)_2-$, X is $N-R^3$, and the R^3 is hydrogen atom, C1~4 lower alkyl group, carboxy group, phenyl group (the said phenyl group may be substituted by lower alkyl group, lower alkoxy group or halogen atom.), 2-pyridyl group, 3-pyridyl group, 4-pyridyl group, furyl group, thienyl group (the said pyridyl group, furyl group and thienyl group may be substituted by lower alkyl group.), C1~4 lower alkyl group substituted by lower alkoxycarbonyl group, lower alkoxy group or cycloalkoxy group, and R^4 is methyl group.

11. The hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of the formula (1) according to in claim 1, wherein R^1 and R^2 are bound together to form C3~4 straight alkylene group or $-(CH_2)_2-O-(CH_2)_2-$, X is $N-R^3$, and the R^3 is C1~4 lower alkyl group which may be substituted by C1~4 lower alkoxy group.

12. A MMP inhibitor characterized of a selective inhibitor of MMP-3 and/or MMP-13 containing as an active ingredient, a hydroxamic acid derivative, a pharmaceutically acceptable salt thereof or a prodrug thereof of any one of claims 1 to 11.

13. The MMP inhibitor of claim 12 characterized of non-selective to MMP-1 and MMP-14.

14. The MMP inhibitor of claim 13 characterized of non-selective to MMP-2 and MMP-9.

15. A therapeutic or prophylactic agent for a disease related to promotion of MMP-3 and/or MMP-13 containing as an active ingredient, a hydroxamic acid derivative, a pharmaceutically acceptable salt thereof

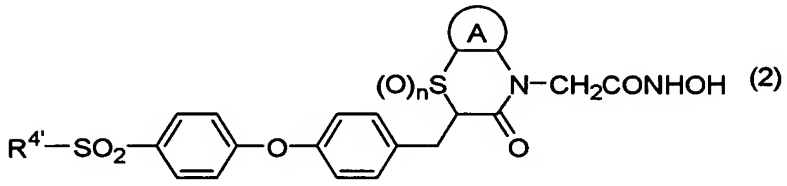
or a prodrug of any one of claims 1 to 11.

16. The therapeutic or prophylactic agent of claim 15, wherein the disease related to promotion of MMP-3 and/or MMP-13 is arthritis.

17. The therapeutic or prophylactic agent for a disease of claim 16, wherein the arthritis is osteoarthritis or rheumatoid arthritis.

18. The therapeutic or prophylactic agent of claim 15, wherein the disease related to promotion of MMP-3 and/or MMP-13 is inflammatory disease.

19. A MMP-3 and/or MMP-13 inhibitor characterized of a non-selective to MMP-1 and MMP-14 containing as an active ingredient, a compound represented by the following formula (2),



, wherein ring A is optionally substituted benzene ring or 5~6 membered hetero aromatic ring, R4' is C1~4 lower alkyl group and n is an integer of 0~2.